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Letter and Reply

Stroke in dialysis patients

To the Editor:

We read with a great interest the report by Park et al [1]. The authors retrospectively examined the risk factors of stroke and its clinical outcomes in 120 end-stage renal disease (ESRD) patients who were on dialysis from 2001 to 2009. They reported that the incidence of ischemic stroke is two-fold higher than that of hemorrhagic stroke in the dialysis population. They concluded that old age, advanced use of diagnostic imaging techniques, and the use of erythropoiesis-stimulating agents are associated with ischemic stroke in ESRD.

Race was previously thought to be an important factor that influences the development and type of stroke. The CHOICE study characterized stroke types in ESRD patients, and ischemic stroke was the most common type in a U.S. dialysis cohort included in that study [2]. However, hemorrhagic stroke was reported to be more common than ischemic stroke in a Japanese cohort [3]. In recent years, the proportion of cerebral hemorrhage among stroke patients has decreased and the proportion of ischemic stroke has markedly increased in the general population. Likewise, changes in the distribution of cerebrovascular diseases in ESRD patients have been reported [4]. These changes might be caused by older patients, or patients with higher co-morbidities, compared with patients in the past. Because similar stroke patterns are seen in the general population and dialysis patients, we can suspect that the higher incidence of ischemic stroke is probably due to the changes in the stroke pattern rather than a specific characteristic of ESRD.

The authors showed that the risk factors for mortality are old age, hypertension, poor mental status on admission, and the absence of diuretics [1]. It is doubtful that the use of a diuretic is independently associated with mortality in the dialysis population. Diuretics are usually continued only in dialysis patients with residual renal function. Therefore, the association between survival and diuretics shown in this study may simply reflect the known lower mortality rate conferred by residual renal function. Moreover, ESRD patients are more likely to receive diuretic therapy only during the early stages of dialysis. The DOPPS study also demonstrated an association between survival and diuretic use in chronic dialysis patients [5]. More evidence is necessary to verify whether diuretic use effectively prevents or relieves stroke in the dialysis patients.

Conflict of interest

None to declare.

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In Reply:

Dear Sir,

As you mentioned, the CHOICE study revealed that the incidence of ischemic stroke was 76% among 200

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cerebrovascular disease events that occurred in 165 dialysis patients during the period from 1995 to 2004 [1]. In contrast, the Okinawa dialysis study group reported cerebral hemorrhage in 162 patients out of 271 strokes that occurred during the period from 1988 to 1998 [2]. In the second half of this observation period, however, the incidence of cerebral infarction increased, reaching the level of cerebral hemorrhage. Another Japanese study also reported that the leading type of stroke changed from cerebral hemorrhage to infarction [3]. Similar findings were obtained in Korea; e.g., the incidence of cerebral hemorrhage in dialysis patients was higher than that of infarction before the year 2000 [4].

It is clear that the incidence of cerebral hemorrhage among stroke patients in the general population has markedly decreased [5–7]. Great advances in brain image studies have contributed to the detection of developing infarctions. Other contributing factors include the increases in the populations of elderly and diabetics and changes in lifestyle and dietary patterns. These factors may also be applicable to dialysis patients. Alternatively, the main cause of this relative decrease in cerebral hemorrhage in dialysis patients could be due to the strict control of hypertension, the use of erythropoietin to correct anemia, and improved dialysis techniques.

We analyzed the various subtypes of stroke, underlying illnesses, onset of stroke, clinical outcomes, prognostic factors, and differences between dialysis modalities. We found that the incidence of ischemic stroke was two-times higher than that of hemorrhagic stroke in the dialysis population. As described in our analysis, the leading type of stroke in dialysis patients in Korea has changed from cerebral hemorrhage to infarction. A greater proportion of the patients with ischemic stroke had diabetes mellitus or were elderly. Stroke occurred most frequently within 1 year after starting dialysis. The therapeutic modality did not influence the clinical features or mortality of stroke.

In general, diuretics are prescribed to dialysis patients who can maintain urine volume. In our study, patients on diuretics had started dialysis therapy more recently than those not taking diuretics (15.6 vs. 30.9 months, $P=0.03$). That is, diuretic use reflects the residual renal function (RRF), which is a well-known predictor of survival. Diuretics help to preserve RRF by minimizing interdialytic weight gain and the risk of hyperkalemia [8]. We regret that we analyzed only the estimated glomerular filtration rate and found no significance correlation to residual urine function. We presumed that these dialysis patients had a better prognosis after stroke because of their satisfactory RRF, as mentioned in the discussion.

Conflict of interest

None to declare.

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